INFORMATION

from the Greater St. Louis Citizens' Committee for Nuclear Information
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RATE OF NUCLEAR EXPLOSIONS HIGHEST IN HISTORY

Figures now available for the first time show that the total number of test explosions by the three nuclear powers rose from 3 in 1948 to 32 in 1957 and to 69 in 1958 (as estimated up to October 31). The number of tests in 1958 is equal to half of all the bombs that had been exploded previously. Of the total of 211 explosions in this 10 year period, 129 have been by the U.S., 55 by the U.S.S.R., and 28 by Great Britain.

"CLEAN" BOMBS MAY BE MORE DANGEROUS THAN "DIRTY" BOMBS

Carbon 14, a radioactive element produced by nuclear explosions, has a long life -- about 8,000 years, and as a result may represent a greater hazard than Strontium 90. It is not due to the "dirty" or fission part of the bomb, but is formed by the impact of the neutrons from bomb explosions on the nitrogen atoms normally present in the air. "Clean" bombs, therefore, which are low in fall-out (including Strontium 90) but high in neutron production, may cause more damage than do "dirty" bombs.

WORLD'S SCIENTISTS AGREE

On Fall-out Danger

The United Nations Scientific Committee on the Effects of Atomic Radiation, at the conclusion of a 2-1/2 year study, issued a unanimous report stating that "Radioactive contamination of the environment resulting from explosion of nuclear weapons constitutes a growing increment to worldwide radiation levels. This involves new and largely unknown hazards to present and future populations..."

On a System for Detecting Nuclear Tests

The Geneva Conference of Scientific Experts on detection concluded that "it is technically feasible to establish ...a workable and effective control system to detect violations of an agreement on a worldwide suspension of nuclear weapons tests."

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A 6 page bulletin giving a more complete story of these recent developments is sent free to all members of the CNI, and is available to others on payment of 10 cents for handling and mailing.

RATE OF NUCLEAR EXPLOSIONS HIGHEST IN HISTORY

Although the health hazard resulting from every additional nuclear explosion has now been confirmed by the international scientific committee that prepared the United Nations Report on the effects of atomic radiation, although East-West experts have recommended a system for detecting nuclear explosions that makes an enforceable test-ban feasible, and although all the nuclear powers have introduced U. N. resolutions urging the establishment of such a ban, explosions continue at the highest rate in history.

In the last six months a total of more than 50 nuclear explosions have occurred. This represents nearly 1/4 of all explosions to date. This is the highest rate of testing for any six-month period since atomic weapons were invented. (See table on page 2, based on the following sources: Bulletin of the Atomic Scientists; communication from Ralph E. Lapp; article by Hanson Baldwin, N. Y. Times, October 10, 1958)

Since the size and nature of most nuclear explosions are not made public, we do not yet know whether this unusually large number of tests will cause an equally great increase in the amount of radioactive fall-out. This will become known in the coming months when the results of continued measurements of the radioactivity of the air are reported. The AEC has stated that it has made an effort, in tests conducted this year, to reduce the amount of fall-out produced by each explosion. However, even if this is true, it will not necessarily reduce the amount of radioactive Carbon 14 resulting from test explosions. This element may be the most important cause of long-term hazards to human heredity.

CARBON 14 MAY BE GREATEST FALL-OUT DANGER

In April 1958 AEC Commissioner Libby revealed in a speech in Lausanne, Switzerland that as a result of nuclear explosions to date, the content of radioactive Carbon 14 in the air had increased about 10 per cent. A study of this problem was made by U. N. experts, but completed too late for inclusion in the U. N. report.

Carbon 14 is absorbed by all living things from the air. Since its radioactivity lasts a long time, it will affect life for about 8,000 years after it is produced. Dr. Linus Pauling has calculated the probable biological effects of radioactiviey from Carbon 14 due to nuclear explosions and concludes that because of its long life it represents a considerably greater hazard to human inheritance than Strontium 90.

Danger in "Clean" Bombs

Unlike Strontium 90, Carbon 14 is not due to the "dirty" or fission portion of nuclear bombs. Instead Carbon 14 is formed by the impact of the neutrons from bomb explosions on the nitrogen atoms normally present in air. As a result, so-called "clean" bombs, which are low in fall-out but high in neutron production, will produce <u>more</u> Carbon 14 than do "dirty" bombs. Pauling's scientific paper on this problem is to appear in Science shortly.

Yearly Number of Explosions

YEAR	U.S.	USSR	BRITAIN	TOTAL
1945	3	0	0	3
1946	2	0	0	2
1947	0	0	0	0
1948	3	0	0	3
1949	0	1	0	1
1950	0	0	0	0
1951	16	3	0	19
1952	10	0	1	11
1953	11	6	2	19
1954	6	6	0	12
1955	15	4	1	20
1956	10	7	4	21
1957	13-16	12	7	32-35
Total through 1957	89-92	39	15	143-146
Estimate for 1958				
Jan-Apr	0	9		
Apr-Sept	30	0	13	69
Sept 1-Oct 15	10*	7		

*Based on announced plans for 10 tests by October 31

OTHER RECENT SCIENTIFIC REPORTS

Radioactivity in Milk

The U. S. Public Health Service is now issuing regular monthly reports of analyses of pooled samples of milk from each of 9 cities in the U.S. Of these cities, the most radioactive milk during July was reported from St. Louis -- 23% of the maximum permissible concentration. (CNI is publishing a separate detailed analysis of these and related milk studies.)

New Compilation of Fall-out Data

The Health and Safety Laboratory of the New York Office of the AEC has collected and published all available data on fall-out radioactivity in air, water, soil, food, animals, and humans. This is the first detailed compilation and is a valuable source of information.

Estimates of Fall-out Hazard

Several new individual scientific analyses of this problem have been published. Although they differ among themselves, none appear to alter the general conclusions reached in the U. N. Report on radiation.

WORLD SCIENTISTS AGREE ON FALL-OUT DANGER

Report by U.N. Scientific Committee on Effects of Atomic Radiation

This report, issued in August of this year, found unanimously that fall-out from nuclear weapons tests is a hazard to human health. For two and a half years 87 scientific experts from 15 countries, including the nuclear powers (U. S., Britain, Soviet Union), made an intense study with the purpose of estimating the biological effects of fall-out radiation on human health. The U. S. representatives on this committee included two members of the Atomic Energy Commission staff and several members of AEC scientific advisory committees. The validity of the report's conclusions has been widely acknowledged by government agencies including the AEC. (See N. Y. Times, August 11, 1958).

Key Committee Conclusions

> "At present effective protection from external radiation sources can only be achieved by adequate shielding or by keeping a safe distance from the source."
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> "Exposure of gonads to even the smallest doses of ionizing radiation can give rise to mutant genes which accumulate, are transmissible to the progeny and are considered to be, in general, harmful to the human race. As the persons who will be affected will belong to future generations, it is important to minimize undue exposures of populations to such radiation and so to safeguard the well being of those who are still unborn."

"Radioactive contamination of the environment resulting from explosion of nuclear weapons constitutes a growing increment to world-wide radiation levels. This involves new and largely unknown hazards to present and future populations; these hazards, by their very nature, are beyond the control of the exposed persons. The committee concludes that all steps designed to minimize irradiation of human populations will act to the benefit of human health. Such steps include the avoidance of unnecessary exposure resulting from medical, industrial, and other procedures for peaceful uses on the one hand and the cessation of contamination of the environment by explosions of nuclear weapons on the other. The committee is aware that considerations involving effective control of all the sources of radiation involve national and international decisions which lie outside the scope of its work."

"Even the smallest amounts of radiation are liable to cause deleterious genetic, and perhaps also somatic, defects." (i.e. cancer)

"Even a slow rise in the environmental radioactivity in the world, whether from weapons tests or any other sources, might eventually cause appreciable damage to large populations before it could be definitely identified as due to irradiation."

Knowledge is Incomplete

The committee estimated the numbers of cases of leukemia and of major genetic effects which may be expected to occur every year as a result of fall-out. It emphasized that all conclusions about the effects of fall-out radiation are based on such uncertain knowledge that "any present attempt to evaluate the effects of sources of radiation to which the world population is exposed can produce only tentative estimates with wide margins of uncertainty". This means that we cannot be sure exactly how much damage will occur and that only extensive scientific study can give us a clear picture of the hazard to which the human race is being exposed by fall-out from tests of nuclear weapons.

New data in the report showed that earlier assumptions about fall-out were incorrect -- for example that fall-out radioactivity would be diluted by being evenly spread over the globe.

EXPERTS RECOMMEND CONTROL SYSTEM FOR NUCLEAR TEST BAN

The Geneva Conference of Scientific Experts on the detection of nuclear weapons tests marked a turning point in international affairs relating to nuclear testing.

Governmental recognition of the desirability of ending nuclear tests is evident from the events that led up to the Geneva Conference. On March 31, 1958 Soviet Union announced that it would suspend tests immediately, citing as a reason that testing "increases the concentration of radioactive elements in air and soil, poisons human organisms, and threatens the normal development of further generations". (Dept. of

State Bulletin, April 21, 1958) The Soviet announcement called on the U.S. and Britain to suspend testing also, and warned that if this did not occur the Soviet Union would reconsider its own suspension.

The U.S. government, regarding an effective system of detecting nuclear explosions as a prerequisite for suspension then proposed an East-West Conference of Scientific Experts to determine whether a feasible system for detecting nuclear explosions could be established. The Conference took place in Geneva during July 1 - August 22, The nations represented were the U. S.; Britain, France, Canada, the Soviet Union, Poland, and Czechoslovakia. The participants were leading experts in the scientific fields involved in detecting nuclear explosions.

Effective Control System

To determine how to detect and identify nuclear explosions anywhere on the earth, the Conference made a detailed study of the avilable methods -- collection of radioactive debris; detection of shocks in earth, water, and air; close examination of suspected explosion sites.

On the basis of this study the experts reported, "The conference has come to the conclusion that it is technically feasible to establish, with the capabilities and limitations indicated below, a workable and effective control system to detect violations of an agreement on a world-wide suspension of nuclear weapons tests." They also stated, "The conference of experts recommends the control system described above for consideration by governments." (N.Y. Times, August 31, 1958)

The success of the Geneva conference of scientific experts was recognized immediately in a statement issued by President Eisenhower on August 22 which said, "The United States welcomes the successful conclusion of the Geneva meeting of experts who have been considering whether and how nuclear weapons tests could be detected. Their conclusions indicate that, if there were an agreement to eliminate such tests, its effective supervision and enforcement would be technically possible." (Dept. of State Bulletin, September 8, 1958)

It should be recalled that the question of detection was the source of considerable controversy in 1957. AEC Commissioners Strauss and Libby, Dr. Edward Teller, and others claimed that an effective detection system was impossible, and that any international agreement to stop testing might serve as a screen behind which a nation could continue to explode test weapons. This view was opposed by other scientists, especially in hearings before the Senate Committee on Disarmament.

Controversy Continues

There are signs that the controversy is not yet over. In an article in the N. Y. Times (October 10, 1958) Hanson Baldwin states, "The officials (identified in the article as connected with the Pentagon and AEC) fear that the public impression is that a foolproof system (i.e. of test detection) is possible and desirable. There is also worry in the Pentagon and the AEC about the effects of any agreed cessation of nuclear testing, a topic scheduled to be discussed with the Russians in Geneva starting October 31.

Negotiations for a Test Ban ...

On the basis of the agreement reached in Geneva the U. S. and Britain on August 22 called on the Soviet Union to join in a conference on October 31 to negotiate the technical features of a plan for a controlled ban on nuclear testing. The announcement stated that the U.S. and Britain would suspend nuclear testing for a one year period beginning on October 31 provided that the Soviet Union indicated a willingness to enter into the called-for negotiations and that substantial progress toward the establishment of a ban was made. (Dept. of State Bulletin, September 8, 1958)

On August 29 Premier Khrushchev accepted this invitation. At the same time he stated that the continued testing of nuclear weapons by the U.S. and Britain during the period of April to August 1958 placed the Soviet Union in a disadvantageous military position in view of the fact that it had ceased to carry out tests in March. He indicated that this situation relieved the Soviet Union of any obligation to continue its cessation of testing. On September 30 the AEC announced that two Soviet tests had been detected, and on October 3 the Soviet Union acknowledged that it had resumed testing. To date a total of 7 new Soviet test explosions have been reported by the AEC. On October 8 Ambassador Gromyko stated that the Soviet Union might now explode as many bombs as the U.S. and Britain have tested since March 31 -- between 40 and 50. (St. Louis Post-Dispatch, October 8, 1958)

The test issue is now being taken up by the United Nations General Assembly. The U.S., the Soviet Union, and India have all introduced resolutions on the issue. Although differing in certain respects, they all propose that the U.N. urge an international agreement to end nuclear testing.

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Note: The information in this bulletin is based on the data available as of October 15.